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ABSTRACT

This paper reports some key aspects of a 2-year study of literacy, technology, and learning funded by DETYA (Commonwealth Department of Education, Training and Youth Affairs) under the Children's Literacy National Projects program. Research reported in the paper was undertaken by a consortium made up of researchers from Queensland, New South Wales, Victoria, and Western Australia. The paper states that the project looked at links between literacy and technology in teaching and learning, with particular emphasis on the use of new information and communications technologies in classrooms. It explains that the project had three main components: a study of practices in a range of learning contexts (mainly primary and secondary classrooms); an examination of some key policy documents which address teaching and learning at various interfaces among literacy, learning, and technology; and a theoretical and conceptual position which informed the study as a whole and the recommendations based upon it. The paper concentrates mainly on ideas and findings pertaining to the school site studies, and, drawing upon aspects of the conceptual and theoretical analyses, considers some strategic and practical implications arising from these. (Contains a table, 6 notes, and 12 references.) (NKA)

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Literacies and Technologies in School Settings: Findings from the Field

Colin Lankshear (QUT) and Chris Bigum (CQU)

Invited keynote address to the joint national conference of the Australian Association for the Teaching of English and the Australian Literacy Educators' Association, Canberra, July 1998.

Introduction and background

This paper reports some key aspects of a two year study of literacy, technology and learning funded by DEETYA under the Children's Literacy National Projects program. The research was undertaken by a consortium made up of researchers from Queensland, New South Wales, Victoria and Western Australia. The present authors were the joint leaders of the consortium. Other members were Cal Durrant, Bill Green, Eileen Honan, Wendy Morgan, Joy Murray, Ilana Snyder and Martyn Wild. The full report of the study has been published as Digital Rhetorics: Literacies and Technologies in Education - Current Practices and Future Directions (3 volumes plus executive summary).[1] The research is also available - suitably reformatted - on the World Wide Web from August 1998.

The project looked at links between literacy and technology in teaching and learning, with particular emphasis on the use of new information and communications technologies in classrooms. It had three main components:

- a study of practices in a range of learning contexts - mainly primary and secondary classrooms
- an examination of some key policy documents which address teaching and learning at various interfaces between literacy, learning and technology
- a theoretical and conceptual position which informed the study as a whole and the recommendations based upon it.

This paper will concentrate mainly on ideas and findings pertaining to the school site studies and, drawing on aspects of our conceptual and theoretical analyses, consider some strategic and practical

implications arising from these.

The school site studies

We studied eleven sites involving around twenty classrooms in New South Wales, Queensland and Victoria. In each site we gathered data relevant to the background and context of teaching and learning in that site. We also gathered data about teaching and learning activities in the sites from in the form of artefacts (e.g., policy documents, inventories of resources, descriptions of student work and learning tasks), interviews and observations. Site selection emphasised 'real world diversity'. Sites were exemplars in the sense of providing informative and illuminating examples of what is actually going on in everyday classroom learning across a range of circumstances and conditions. Variables included different professional knowledge bases, policy arrangements, access to physical and human resources, geographical locations, year levels, subject areas, and the like. The range of sites is captured in Table 1 below.

See Table 1. Classroom based site studies

We did not attempt detailed studies over extended periods. In most cases data was collected over no more than three or four days. The emphasis, rather, was on finding and describing illuminating instances of practice. We explored individual episodes and events in depth, to see what they could tell us in their own right about the kind of learning experiences and activities involving literacy and technology going on in such instances. We 'triangulated' data from different collection sources - policy documents and other artefacts, interview material, observations - and across different episodes within and across sites. Consistencies across these variables increased our confidence in the data collected. We also checked our data-based descriptions against diverse reports of research collected by other people in other contexts as a test of likely authenticity and reliability. Most importantly, we ran very rigorous member checks on our descriptions and handling of the data, eliciting forthright and, in many cases, detailed responses from participants. These were taken very seriously into account in the final rewrites. Where there was genuine difference in interpretation we erred in favour of the participants' views.

Table 1. ***Classroom based site studies***

Site	State	Level	Band	City/ Rural	Type	KLA
Abbotsdale: Theory informed practice in a Year 5 classroom	Qld	P	UP	Rural	State	English Mathematics Science The Arts
BushNet Schools – Uneven potential	Qld	P S	UO LS	Rural	State	English Technology
Castleton: Computer basics makes for competent, confident Year One students	NSW	P	LP	City	State	English
Ealing Grammar – A site of computer integration	Vic	S	LS	City	Private	English
Elmwood: Technology in transition as a key learning area	Qld	S	LS	City	State	Technology
Facing the challenge in a remote rural region	Qld	PS	UP LS	Rural	State	English Technology SOSE
In splendid isolation: Caldwell Primary School	NSW	P	LP UP	Rural	State	English
Multimedia support for multicultural students at Carlisle Primary School	NSW	P	LP UP	City	State	English
New Park Primary	Vic	P	LP	City	State	English
New technologies, old timetables: The difficulties of embedding computer use across the high school curriculum	NSW	S	LS US	City	State	English
Spur primary School: Melding the old with the new	NSW	P	LP UP	Rural	State	English

(Lankshear, Bigum et al 1997: Vol 2. pp 1-2)

Key

State: Qld (Queensland); Vic (Victoria); NSW (New South Wales)
Level: P (Primary); S (Secondary)
Band: UP (Upper Primary); LP (Lower Primary): LS (Lower Secondary); US (Upper Secondary)
Type: State or private Funding
Key Learning Area: SOSE (Study of Society and Environment)

Literacies and technologies in the study sites

To maximise the focus and 'evenness' of site study reports, we employed a template. Each study report began with a succinct overview: the study 'at a glance'. The site itself was then described (in terms of socio-economic status, physical characteristics, size, demographics and the like), along with its particular policy context. The body of each site study comprised an account of the practice we observed and otherwise gleaned from interviews, documents, artefacts, etc. Distinctive features of the practice were identified, described, and analysed. Each study report concluded by distilling significant issues and implications emerging from it. The site studies constitute volume 2 of the project report.

The classrooms we observed varied considerably in terms of technological 'tools' employed, and the relative extent to which and ways in which they were employed in learning generally, and literacy education more specifically. One classroom employed no 'new technologies' whatsoever in the component of its subject Technology program we observed. In designing, making and appraising their home garden projects, students and teacher in this classroom employed pen and paper, blackboard, and OHP only. At the other extreme were classrooms employing Internet access (email, WWW) and an array of (other) multimedia applications - e.g., CD-ROMs, presentation software, Quick Take cameras, sound and animation software -- on a daily basis. In one case, a site had indirect access to a CD-ROM burner, by which their Hypercard presentations were published as a CD-ROM. In between these poles, classrooms ran the hardware gamut from Apple IIe's to pentium-powered PCs, employing diverse word processing, drawing-painting-graphics, and desktop publishing software.

Literacy activities were varied, if to a large extent predictable and characteristically 'school-like'. In possibly the most pedagogically sophisticated site, a Year 5 class in a low socio-economic status area undertook an integrated theme-based unit of work in which learners produced film narratives (movie scripts), biographies, reports, poster advertisements, invitations, explanations, justifications, evaluations, and procedural accounts, as constitutive elements of the overall unit. Literacy activities across all of these forms (and more besides) were encountered within single observation sessions. A 'snapshot' from a different site describes students trying to access information on the WWW and, when it was not available, soliciting it by email request to the relevant Website personnel. Another captures SuccessMaker and SentenceMaster programs being used to improve mastery of basic literacy skills. Examples are provided of teachers and students working together to format email interviews for presentation on the Web, to present projects (e.g., on local endangered species) as a series of web pages, and to create individual student web pages. One such example portrays a

12 year old student laboriously producing a sentence stating his name and age, with close support from the teacher, prior to beginning his web page. In most cases, 'web work' - indeed, computer-produced work in general -- was roughed out first using pen and paper before being produced in electronic form. Other examples capture students using computers for producing 5-minute plays, jointly constructed retellings of individual pages of The Magic Flute, producing newspapers reporting stories about the school, making Christmas cards, and producing brochures about aspects of the local town. Hypercard presentations were popular forms. These ranged from sequences of individual stories (including voice overs and illustrations to supplement straight text), to a presentation designed to augment the Principal's end of year speech; via information reports on Olympic athletes, a history of the school, environmental project reports, and the like. At primary school level, producing stories using a range of computer applications was strongly in evidence. These activities ranged from producing interactive stories based on modern myths and legends to more straightforward productions using story board panel formats and software which simulated storybook space. In the one 'traditional' classroom observed, students maintained garden diaries, produced 'spec analyses' and 'consider all factors (CAF) statements. They interviewed neighbours about what grows well and doesn't under local conditions, wrote reports of their projects, and made formal oral presentations of reports using card notes, OHTs, and other prompts - aiming to get as close as possible to how 'experts' present technology project reports in real life.

Key themes and findings from the site studies

The sites were individually distinctive and interesting as well as sharing some important features more or less in common - not only among themselves but in relation to classrooms and schools across the country.

We had three related tasks to perform with respect to the site studies. First, we had to make sense of them individually and collectively. That is, what do these studies tell us that is of interest and significance for educational practice? Second, we had to make judgments and decisions about what went on in the sites (based on the sense we made of them). In other words, what do we think about this practice? Is it good education? Could something else be done, and if so, should it be? And so on. Finally, we drew on the site studies in framing concrete recommendations for future actions and policies.

In doing this work we drew on three broad 'patterns' that seemed to be reflected in data from the sites. These patterns were named 'complexity', 'fragility', and 'continuity'. We also made use of four 'principles' developed in other relevant work (Bigum & Kenway, 1998).

These principles are 'teachers first', 'complementarity', 'workability' and 'equity'. We will first describe these and how they relate to what was going on in the sites. After that we will consider some of the ways they can be addressed in our attempts to develop more effective policies and practices in everyday educational activity.

The Patterns

Complexity

Understanding classrooms as complex was useful both in making sense of what we saw and in thinking beyond current practice. Classrooms are complex in the sense of having a large number of inter-relating components operating within them and beyond them. In using the term 'complex' to describe a classroom, we are not simply pointing to the obvious state of these physical spaces but, rather, are drawing on ideas from the emerging field of knowledge broadly known as complexity theory (Waldrop, 1992). In this perspective, classrooms are self-organising - they have to organise themselves - around the interactions between their various human and non human components. Each time a new component - like a new technology or a new policy - is added, it does not simply feed one more 'thing' into the mix in a linear way. Rather, it adds a compound effect which is closer to being exponential than linear. The new component rearranges all the other interactions, and may add many more in its own right. Classroom practices then have to reorganise themselves around this new complexity: changes in roles, changes in relationships, changes in patterns of work and allocations of space in the classroom, and so on.

Adding Internet connections, for instance, brings into the classroom a whole new set of agents - remote computers, students and teachers in other parts of the world - which impact in complex and often unpredictable ways on what occurs in class. Being involved in projects with other groups/classrooms elsewhere changes the nature of classroom projects in profound ways. It is no longer simply a matter of adapting to local conditions as was normally the case when print prevailed. Now classrooms have to take account of different cultural ways of interacting, become culturally sensitive, handle language differences, understand different ranges of experience and world views, and deal with various technical complications - like managing telecommunication links and the like.

Teachers need to understand their work contexts as being complex in this way, and to be prepared in ways that enable them to produce effective strategies for handling complexity - to arrive at forms of classroom self-organisation which are optimal for producing learning outcomes. How far teachers are successful here will have a lot to do from now on with their capacities to 'negotiate' with technologies that

are much less compliant than students, as well as with students who are often more skilled than teachers at assigning roles to new technologies.

Fragility

To be effective, the components of self-organising systems must assign roles mutually and successfully among themselves. When a component is unable to play its role in a classroom - be it a teacher, a student, a computer, a modem, a phone line - the behaviour of a classroom will very likely be unable to reorganise in a way that allows computer use to continue in curriculum work (at least, in the immediate and short run). Classrooms are especially sensitive to the loss of certain components, like an expert teacher, an essential piece of software, a phone connection.

Schools need ways of covering (potential) points of fragility as far as possible. Many of our site studies focused on issues and implications arising from technical aspects of fragility - difficulties accessing the Internet; difficulties getting enough technical support to keep things running. We also found non-technical examples of fragility related to professional knowledge and understanding of how to integrate new technologies meaningfully and transparently into learning activities. Different sites looked for different ways to address fragility where they were aware of it. However, schools are by no means equal in terms of their ability to address or recognise potential fragilities. For instance, some schools can instigate reforms knowing they will be able to continue funding them, while others have strictly limited resources and, therefore, fewer options (Secada, 1989).

Continuity

Effective learning programs call for continuity from point to point, as well as across individual components of programs. Continuity breaks down where, for example, students do computing-rich work on a regular basis one year and rarely get to a new technology the next. Discontinuities can also arise where there is inadequate programming for scope and sequence, and where there are uneven concentrations of new technology resources - human and non human - within schools and between schools. Since schools and classrooms are complex systems, uneven concentrations of expertise and equipment are to be expected, and achieving more even distributions is not easy. Nonetheless, continuity must be pursued strategically: especially within a school and among local schools (including, from feeder primary to secondary schools).

The Principles

'Teachers first'

This principle recognises the need to attend to teachers' needs in learning new technologies and their relationship to language and literacy across the curriculum even before addressing the needs of students. Teachers need support in making use of new technologies to enhance their personal work even before learning to use it in their teaching. For teachers to make sound educational choices about using new technologies in classroom practice they must first know how to use them (and any benefits of doing so) for their own purposes.

Teachers need a good conceptual and theoretical grasp of their work. It is important to recognise that devoting time and resources to upgrading teacher skills and knowledge means less time and other resources available for other initiatives and priorities - which may include less resources for new hardware and software. This requires getting clear about what is valued in a school's mission, and organising priorities in coherent ways.

Complementarity

This principle emphasises the importance of understanding the adoption of a particular technology in as broad a context as possible, especially in relation to language and literacy concerns across the curriculum. For instance, it draws attention to the complementary skills and knowledge necessary for the sensible use of hardware and software. This means knowing about the limits, assumptions and approximations built into hardware[2] and software. This principle directly addresses the complex nature of the use of the new CITs in classrooms. Thoughtless use of software is equivalent to blindly assigning roles to software that either don't exist or are incorrect. The principle works at many levels and can be employed to think about the relationship between computer use in the home and in schools.

Workability

This principle deals with the crucial test for implementation of any new technology—does it improve the teaching and learning cycle? Considering workability in the introduction of new CITs includes factors such as the cost of teachers' time in learning how to use it and in the redesign of curriculum. The principle requires that the use of any hardware or software improves, helps, or supports the work of teachers or students. It affirms that the work of teachers and students is a priority in determining whether or not to adopt or implement a particular technology. Because we are dealing with complex systems, this is difficult to determine in advance. Hence, any adoption of new technology requires a principled approach that acknowledges the actual costs associated with taking on a new technology.

Equity

It is important to pursue equitable access to computing resources and

information so that teachers and students can make informed decisions about using new technologies. Using new technologies always involves decisions about resource allocation. This is made difficult where resources and expertise are unevenly distributed - between schools or across curriculum areas within a school. Schools and curriculum areas that are 'resource poor' in equipment and knowledge end up getting less, while those with some get more (the principle of increasing returns) (Waldrop, 1992: 34-38). It is important to build up sufficient knowledge in impoverished areas to enable them to attract material resources by 'natural' means. Likewise, the fact that some learners have greater physical access than others to new technologies and relevant expertise inevitably creates conditions for unequal learning opportunities and outcomes. Here also it is important that schools are able to pursue effective strategies to buffer disadvantaged students from the effects of the uneven distribution of material resources and information.

Critical Reflections

This is basically where the project ended up. We outlined the patterns and principles, used them to make sense of the sites studies, and then went on to suggest how the issues and implications around the patterns and principles might be addressed under prevailing conditions.

For example, with regard to 'fragility', we suggested development of school policies -- supported by state and national level policies -- designed to reduce fragility by such means as addressing the integration of new technologies into teaching and learning as an across the curriculum initiative involving all members of staff; and by working in collaboration with state/territory and sector administrations to achieve appropriate balances between investment in new technology infrastructure, operational and technical support, and teacher professional development. Similarly, aspects of 'continuity' were addressed by suggesting cross school links, development of language and technology policies in conjunction with each other and with all other learning areas, and with serious regard for point to point sequences.

In the case of 'complementarity', the importance of including the cultural and critical dimensions of literacy and new technological practices, to augment the operational dimension, was emphasised. It was noted, for example, that new technologies are often used to gather information for classroom assignments and projects. This suggests the importance of complementarity with respect to the cultural dimensions of computer-mediated literacies and social practices (e.g. getting the genre 'right', doing it as it is done in real life), and developing skills for evaluating as well as gathering information, and for assembling it into cogent viewpoints and arguments.

Overall, our strategies and recommendations emphasised: policy initiatives; procedural changes at school level; appropriate attention to professional development to enhance teacher awareness; support for the three dimensional model of literacy (Green, 1988) to ensure that learning involving new technologies does not get fixated at the operational level; and the like.

This is very much a 'systemic' response. It honours the original project brief, the funding source, everyday institutional 'realities', and the like -- including the mind-sets, understandings, and experiences brought to the project by the researchers themselves.[3] As a statement intended to help schools manage the transition to a more thoroughly technologised way of being, it certainly offers some ways forward under present operating assumptions.

In the remainder of this paper, however, we want to begin extending our own thinking and imagining a little further. To do this requires expanding and taking a harder look at 'the field': at the sites and the practices we observed, the policy analysis, the theories and concepts we employed, and the findings. By way of beginning this process we will address a selection of aspects here.

Change and stasis

Standing back from the project after its completion, two things stand out in particular from the accounts of practice presented in the site studies. The first is how characteristically 'school-like' in general the practices are: c.f., retelling stories, producing Hypercard sequences of stories, producing electronic variations around the time worn tradition of the project, and so on. The second is how little things at the chalkface have changed in substance since the 1970s and 80s, for all the hi tech push into language and literacy education. Much of what we saw in the sites might not unfairly be described as 1970s-80s process writing in 'electronic drag'; children's literature 'gone digital'; and projects presented as web pages as opposed to literal 'downloading' and cutting from print texts, and pasting to workbooks. And so on.

In other words, the substance of learning and teaching remains more or less the same, only 'technologised' under a new technology regime. This has been referred to as the 'old wine in new bottles' syndrome. The site studies largely affirm Seymour Papert's (Papert, 1993) wry observation that someone from the 19th century could step into a contemporary classroom and know at a glance where they were, and Steven Hodas' arguments about the capacity of classrooms to shape successive technologies to familiar classroom forms (Hodas, 1996).

Interestingly, while much inside the classroom remains substantially

the same, schools have undergone quite phenomenal changes as institutions since the 1970s in the ways they are related to, or articulate with, the wider world beyond. For example, in the 1970s schools still enjoyed status as free-standing institutions that related to other institutions via well-established 'pathways'. For instance, they articulated to the economy by turning out 'graduates' whose credentials allocated them to 'appropriate' places in a not-yet-oversubscribed workforce. Today, however, schools have been recruited into the economy in much more direct ways. They are, simultaneously, businesses and sites for business: within the economy rather more than being articulated to it.

These massive changes are not (yet) matched by substantive changes at the level of operating logics within the classrooms - although, pushes for enterprise education and the like have more than gestured toward such incorporation. At the same time, schools might in other respects be seen as being very neatly 'in sync' with larger trends. In terms we will develop here, schools might well be seen as a case of a larger phenomenon involving a fracturing of 'space' and a divergence in 'mind sets'. In this respect, schools stand very much onside with other institutions in the face of the emerging new space known as the Internet.

We will explore these ideas by brief reference to three related distinctions drawn by John Perry Barlow (in Tunbridge, 1995): distinctions which have to do with modes of controlling - controlling values, morals, knowledge, competence and the like.

Barlow's first distinction is between paradigms of value operating in 'physical' space and 'information/cyber' space respectively. In physical space, says Barlow, controlled economics increases value by regulating scarcity. To take the case of diamonds, the value of diamonds is not a function of their degree of rarity or actual scarceness but, rather, of the fact that a single corporation owns most of them - hence, can regulate or control scarcity. On this paradigm, scarcity has value. We might note here how schools have traditionally operated to regulate scarcity of credentialled achievement - including literacies. This has maintained scarce 'supply' and, to that extent, high value for those achievements which are suitably credentialled.

In the economy of Cyberspace, however, the opposite holds. Barlow argues that with information it is familiarity, not scarcity, that has value. With information,

> it's dispersion that has the value, and it's not a commodity, it's a relationship and as in any relationship, the more that's going back and forth the higher the value of the relationship. People don't get this if they're coming from the industrial-era model. (Barlow in Tunbridge, 1995)

The point here is that if we approach the new 'space' in old ways we will miss out on options that are there to be had - which, in some instances might mean missing out or losing altogether in the long run. What is at issue here are different spaces and different mind sets, and where schools stand in relation to these.

These differences are amplified by Barlow by reference to different ways of looking at well known issues and concerns associated with cyber space. He uses the examples of pornography on the Net and Bill Gates' apparent manoeuvre to gain control of the Internet by bundling Microsoft Network with Windows 95/98. There are very different ways of looking at these concerns depending on whether one comes from the physical space-industrial mind-set or from the alternative mind set.

With respect to pornography on the Net, Barlow rejects the imposition of gross filters. To begin with, they can't work - because Net-space simply cannot be controlled in that way. The more elaborate the filter, the more elaborate the search to find ways around it, and the more powerful these resistances become. Barlow advocates more local, individualised filters that work on the principle of people taking responsibility for their choices and deciding what 'noise' they want to filter out.

If you have concerns about your children looking at pornography the answer is not to eliminate pornography from the world, which will never happen; the answer is to raise them to find it as distasteful as you do. (Barlow in Tunbridge, 1995)

Similarly, with the fear of Microsoft controlling Net-space, the point is that the Internet 'is too complex for any one person or organisation to create the software for it'. Software development will continue to be organic, to be shared and dispersed. Short term domains of control and influence will undoubtedly exist, but they cannot become total or monopolistic - by the very nature of the space.

Barlow's third distinction is between those he calls 'immigrants' in Cyberspace, and those he calls 'natives'. This is the difference between those who have, as it were, 'been born and grown up' in Net-space (the natives) and those who have, as it were, migrated to it. More to the point, it distinguishes those who 'understand the Internet, virtual concepts and the IT world generally' from those who do not: i.e., it distinguishes mind-sets. Immigrants don't have the experiences, history and resources available to them that natives have and, to that extent, cannot understand the space that natives do. Barlow believes this distinction falls very much along age lines:

> generally speaking, if you're over 25, you're an immigrant. If you're under 25 you're closer to being a native, in terms of understanding what it [i.e., the Internet, virtual concepts and the IT world generally] is and having a real basic sense it. (Barlow in Tunbridge, 1995)

We'll use Barlow's immigrants and natives as markers[4] for the two broad mind sets we've identified: one which affirms the world as the same but just more technologised; the other which asserts that the world, because of the operation of these new technologies, is radically different.

With this background in place we will return to the four principles identified in the project and show how they are read by the two mind-sets. This will point to limitations we believe are inherent in the principles to the extent that they are approached from the standpoint of current systemic assumptions - which, in Barlow's terms, can be seen as the mind-set of the 'immigrants'.

Complementarity

From an immigrant perspective, the increasing capacity of new technologies to perform many of the operations that are deemed to be important skills for young people to have is met in one or other of two ways. While the capacity of the new technology to carry out a particular operation is acknowledged, the importance of students being able to carry out the operation without the support of a computer is demanded. Typical examples include debates around handwriting, use of calculators, spelling checkers, and graphic design software. Commonly, there is an element of nostalgia here for the 'old ways of doing things' that signals a broader set of interests that are found in movements like 'back to the basics'.

Complementarity from a native perspective is based upon an acknowledgement that machines now do many of the operations that are taught in schools. It becomes a matter of delegation (Bigum, 1997), of determining the conditions under which a computer is employed to carry out a particular function. For some technologies, sound educational practices can be identified -- for instance, with the use of a calculator -- but for other technologies, such as the Internet, it is far from clear what might be appropriate complementary skills and knowledges. In this respect, we (immigrants) may need to learn a good deal more about how natives use this particular medium. Easy complementarity claims about the 'information literacy' needs of students reflect an immigrant perspective informed by understandings of print literacies and practices: in effect, immigrants telling natives how to live in the natives' own space.

Teachers First

In the new framing we have proposed, putting teachers first appears as

an element of the native mind-set. Well-intentioned, but generally misplaced, concerns for prioritising the needs of students (heavy duty child-centredness) derives from the immigrant mind-set in which the new technologies are, like any other aspect of curriculum, a safe selection made for the young by the old, a decision about what is worth knowing. A strong characteristic of the early years of computers in schools was a belief in what might be termed 'trainer-wheel' software for the young. It was argued that fully configured software, being an 'adult' productivity tool, was beyond the grasp and capacities of the young.[5] Despite the failure of trainer-wheel assumptions and approaches in the past, these well-intentioned but flawed practices continue in classrooms today.

Affirming that teachers need to be put first flows directly from the native mind-set. Like the application of complementarity, it is easy to subvert its intent by developing practices that appear to put teachers first but are really short term professional development activities designed to put teachers into classrooms with improved technological skills and understandings, but within the confines of the immigrant world view. It is seemingly assumed that having 'put teachers first' for a particular period the problems of teaching about and with the new communication and information technologies are thereby solved. From a native perspective, this can never be so: and even if it were somehow possible, it would not be desirable. A native perspective emphasises the importance of addressing the ongoing needs of teachers, but at the same time points to the importance of developing new kinds of alignments and associations between immigrants and natives. We found some of these inclinations in some of the sites we studied. Typically, however, the larger constraints of schooling based upon an immigrant mind-set--such as the teacher being ultimate authority--render such practices fragile and, in the long run, ineffectual.

Workability

In his seminal text[6] of 1976, Joseph Weizenbaum wrote eloquently of the dangers of allowing computers to do things solely on the basis that they can be done using a computer. He made a distinction between computing 'cans' and computing 'oughts'. From his perspective, the application of a computer to a task is a moral issue which should not be determined solely on efficiency grounds. To immigrants, workability is almost entirely a matter of efficiency. To natives, however, it is a much more: including a sense of elegance, beauty (Gelernter, 1998), appropriateness, and other criteria which we, as immigrants, still perceive but dimly. Across the two broad mind-sets, we have two very different perceptions of workability.

For teachers, then, the test is not so much whether the computer does the job, but to what extent the practice is inclusive of the

sensibilities of the natives. We know this is no easy matter and is always confounded by the dominant views that teachers, schools, parents and systems 'know what is best'. Our argument is based on the proposition that, for perhaps the first time in human history, new technologies have amplified the capacities and skills of the young to such an extent that many conventional assumptions about curriculum become inappropriate.

Equity

We argued in the report and in this paper that simple calls for redistributive action based upon observation of an uneven distribution of knowledges and resources are, in light of theories of complexity, doomed to fail. An immigrant perspective on equity focuses on redistribution; on allocating to the disenfranchised knowledge and resources to help them catch up. What is interesting about this approach is how persistent it is in the face of a long history of failure. For example, in the mid 1980s in Victoria the state-funded element of the computer education program determined that teachers eligible for attending professional development activities be drawn from non-mathematics and non-science backgrounds and, preferably, be female. Those teachers who were given the opportunity to be professionally developed in classroom computer use returned to their schools to be generally ignored, isolated, and even disadvantaged as the price of participating in an activity seen to be wasteful of scarce professional development resources.

Clearly, access to resources and knowledge is important, but without access to the networks, associations and alliances that support and sustain concentrations of technological resources, skills and knowledge, it is a waste. Barlow (in Tunbridge, 1995) makes the point that so much of what he expected to happen in Cyberspace has turned out to be the opposite, and mused further that, "in broad terms, we're moving into an environment that is about relationship instead of property and that is feminine rather than masculine". Only very rarely in the sites we studied did we find practices that appeared to be informed by mature awareness of the importance of networking and relationships.

Networks and control

We have used the simple device of the two mind-sets, of immigrants and natives, to revisit the principles used in the original study. We believe that looking at them in terms of these competing mind-sets illuminates what we believe are the three major tensions facing schools today. Maintaining practices and policies based on the assumption of a

world that is not much changed from that of two decades ago, a world that has merely been 'technologised', is proving increasingly difficult and unsustainable in the face of pressures from the outside world in which things are in fact much changed.

The first tension is that schools face a sizeable cohort of natives largely indifferent to and bemused by the quaint practices of schooling. This is a cohort that is in tune and largely at ease with the dizzy pace of change, with the development of new technologies, and with social and economic shifts that cause pain to many immigrants.

The second tension results from an immigrant understanding of the new communication and information technologies as networks of control (Bigum, Fitzclarence, Green, & Kenway, 1994). Schools are repositioned simultaneously as sites which sell services and sites where goods and services can be sold (Kenway, Bigum, & Fitzclarence, 1993). This conflicts with the traditional values of public schooling which were distanced from philistinic notions of markets and market forces.

The third tension comes from the administrations of school systems (Departments of State and Catholic Education) which, on the one hand, offer schools 'autonomy' through devolution, and on the other impose technology-based systems that attempt to control what schools do more than ever before.

In the case of both the second and third tensions, schools are positioned as compliant agents, that are relatively easily enrolled into business client relationships and system-based accountability networks. This serves the interests of business in two ways: by making schools more like businesses and by having schools conform to the educational roles that business assigns them.

Final remarks

One point of departure for this paper was a perception of the project's legitimate concern with 'what to do on Monday'. Having made a wide ranging extension of our thinking beyond the forays of the project, we want to return to Monday, and suggest some ways of working in and thinking about the classroom in relation to literacy and technology.

These go beyond Monday mornings in school classrooms and apply equally to teacher education, policy making in government and school systems, educational research into literacy and technology.

Our brief extension of the research findings presented in the report indicates there are no easy solutions to the challenges of integrating new technologies into classroom learning generally and literacy education in particular. What solutions there are will likely be counter intuitive, emerging from a mind-set to which we immigrants at

present have limited access at best. To this end educators need to be suspicious of easy fixes at classroom, school, system, or federal policy levels. We believe that at this historical juncture the future should be seen as open. Hence, the proper role of schooling is to keep the future open for young people, not to close it off. This, of course, is an extremely difficult position to adopt given the authority and control schools have exerted historically over the future of the young. Schools are good at closing and controlling futures. What the young will have done with their nativeness fifty years hence will depend on what we do now.

It is not that we lack strategies and practices that can open up schooling and futures for the young. What we believe is missing is a mind-set that is able to re-perceive schooling, teaching, literacy and the new technologies in ways that are more resonant with the very different circumstances existing outside schools. We are advocating keeping things open, letting diverse discourses into the classroom rather than shutting them out, honouring nativeness, and revisiting what it means to operate an inclusive classroom in the light of ideas like those of Barlow. We are struggling to write this advice, mindful that the mind-set of the immigrant as we have described it in this paper pervades our own work. As we encourage you, so we will struggle not to be satisfied with what others tell us about the directions of education, but to constantly try and expand our own understandings of what is and what might be.

Making distinctions between immigrants and natives in these debates takes us only so far. As the natives remind us again and again, in order to act in the world, to make a difference, it is the alliances and articulations we make with humans and, importantly with non-humans that matter. As Grint and Woolgar (1997: 168) argue:

> those seeking to change the world might try strategies to recruit powerful allies rather than assuming that the quest for truth will, in and of itself, lead to dramatic changes in levels and forms of social inequality.

Notes

1. This report is available from Stephanie Gunn or c/o Faculty of Education, Griffith University, Mt Gravatt Campus.

2. Which in most respects can be regarded a 'crystallised' software.

3. It is fair to suggest that there was a sense among the project team that we did not want to get too far away from 'Monday morning'.

4. In employing these two terms as we will, we are well aware of the ways in which this distinction is employed by racist and related

interests to define natives or immigrants as irreconcilably inferior to immigrants or natives respectively. No such implications are imputed here. As markers in this paper, however, they provide a powerful distinction that we believe is useful in underlining a critical blind spot in many educational accounts of literacy and technology.

5. The programming language LOGO is an interesting example in this respect. Promoted and largely understood by most teachers as an 'easy' and young children's avenue into programming, the language is arguably one of the most sophisticated available to schools, being a subset of LISP. That its import was largely missed or ignored by teachers is consistent with a dominant mind-set that understands students as deficient and teachers the traditional arbiters of what is worth knowing.

6. Republished in 1984: (Weizenbaum, 1984).

References

Bigum, C. (1997). Teachers and computers: in control or being controlled? *Australian Journal of Education*, 41(3), 247-261.

Bigum, C., Fitzclarence, L., Green, B., & Kenway, J. (1994). Connecting schools to global networks one way or another, *Apitite 94* (pp. 359-366). Brisbane: Apitite 94 Council.

Bigum, C., & Kenway, J. (1998). New Information Technologies and the Ambiguous Future of Schooling: some possible scenarios. In A. Hargreaves, A. Lieberman, M. Fullan, & D. Hopkins (Eds.), *International Handbook of Educational Change*. Hingham, MA: Kluwer Academic Publishers.

Gelernter, D. (1998). *Machine Beauty. Elegance and the Heart of Technology*. New York: Basic Books.

Green, B. (1988). *Subject-Specific Literacy and School Learning: A Focus on Writing*. Australian Journal of Education, 32(2), 156-179.

Grint, K., & Woolgar, S. (1997). *The Machine at Work: Technology, Work, and Organization*. Cambridge, UK: Polity.

Hodas, S. (1996). Technology refusal and the organizational culture of schools. In R. Kling (Ed.), *Computerization and controversy : value conflicts and social choices* (2nd ed., pp. 197-218). San Diego: Academic Press.

Kenway, J., Bigum, C., & Fitzclarence, L. (1993). Marketing Education in the Postmodern Age. *Journal of Education Policy*, 8(2), 105-123.

Papert, S. (1993). *The Children's Machine: Rethinking School in the Age of the Computer*. New York: Basic Books.

Tunbridge, N. (1995). The Cyberspace Cowboy. *Australian Personal Computer*. September.

Waldrop, M. M. (1992). *Complexity. The emerging science at the edge of chaos and order*. London: Viking.

Weizenbaum, J. (1984). *Computer Power and Human reason. From Judgement to Calculation*. Harmondsworth, Middlesex: Penguin.

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